(3.) THE BERTRAND-THIEL PROCESS.

This process, the first patent for which was taken out in the year 1894, was first carried out with solid charges, as also Monell's process described hereafter. Great results were, however, only achieved after resorting to molten charges*

It was originated on the assumption that the large quanti* ties of slag proceeding from the elimination of the reducing agents must unfavourably influence the process if the " heat " were burdened with them to the end, and this assumption made it appear advantageous to divide the process into two operations, rendering possible the removal of the slag which occurred in the first operation. It proved that in the main Si, Mn and P were removed in the first operation, whilst the carbon content was only reduced about one-third.

This first portion of the process is, therefore, uncommonly like the Krupp process, but since it is conducted in a basic open-hearth furnace, which permits the attainment of higher temperatures, it achieved the immediate decomposition of the iron silicates and phosphates almost completely into the limesalts, and reduction to a minimum of the iron content of the resulting slag. Owing to this, the possibility increased of better utilisation of the materials charged, and simultaneously* of yield of metal.

As shown by the statements on p. 183, in the case of only partial decarburisaticn, one can diminish the quantity of slag due to 1 unit Si02 to 2*9 units, whilst in the case of complete decarburisalion this rises to 4*78 units. Therefore, an interruption of the process at a lesser decarburisation involves the products of elimination of silicon, manganese and phosphorus going over into a more concentrated form than is otherwise possible, thereby giving rise to a diminution in the quantity of slag, and as a consequence also of total heat required.

The first advantage, namely, greater concentration of SiOa, and P^Os in the slag is fully attained actually. The second, however, the diminution .of the total amount of slag and its influence on the total heat requirement is, owing to another condition, made illusory. After ending the first operation the